Teaching Sin and Cosine Instrument

Abstract

A device that teaches the relationship between a right triangle, the length of its hypotenuse, the length of its two sides and the trigonometric functions. The device includes a horizontal and vertical ruler attached by a sliding attachment bracket. A circular plate showing 360 degrees of the circle is attached to the horizontal ruler along with a pivoting ruler that can rotate 360 degrees around the circular plate. By sliding the vertical ruler to different positions along the horizontal ruler and revolving the pivoting ruler to different angles (θ), the height of the vertical ruler (Y) where it intersects the pivoting ruler, the length of the horizontal ruler (X) where it intersects the vertical ruler, and the length of the of the pivoting ruler (R) where it intersects the vertical ruler can be measured. The trigonometric functions can then be calculated by their relationship with the measured values of X, Y, R and θ. For example, sin θ= Y / R and cosine θ= X / R. The sin and cosine functions and other trigonometric functions can be calculated and plotted (e.g. θ vs. Y/R) by varying the position of the rulers with respect to each other.